Before the FEDERAL COMMUNICATIONS COMMISSION Washington, DC 20554

In the Matter of)	
)	
Expanding the Economic and Innovation)	Docket No. 12-268
Opportunities of Spectrum Through Incentive)	
Auctions)	

REPLY COMMENTS OF VERIZON AND VERIZON WIRELESS

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TABLE OF CONTENTS

I.	THERE IS CONSENSUS ON KEY BAND PLAN FEATURES AND PRINCIPLES	1
A.	Agreement Is Emerging Among Operators and Device Manufacturers on the Sizes of the Duplex Gap and Other Guard Bands	
В.	Most Parties Agree that Technical Considerations Preclude TDD Operations in the 600 MHz Band.	
II.	VERIZON SUPPORTS AUTHORIZING UNLICENSED OPERATIONS IN THE GUARD BANDS AND DUPLEX GAP	8
A.	Authorizing Low-Powered Unlicensed Operations Will Meet the Statutory Requirement that they Not Cause Interference	
B.	Authorizing Unlicensed Operations in Guard Bands While Maximizing Licensed Spectrum Would Achieve Congress's Objectives	.10
	The Spectrum Act Mandates that All Auctionable Spectrum Be Repurposed via the Forward Auction	.10
	2. Proponents of Reducing Licensed Spectrum Fail to Defend the Legality of their Proposals	.12
	3. Compromising the Optimal Band Plan Would Jeopardize the Fiscal Targets of the Incentive Auction and Harm Consumers	.14
III.	THE COMMISSION SHOULD REJECT CALLS FOR RULES THAT WOULD FAVOR SOME BIDDERS OR SUPPRESS BIDDING.	
A.	The Commission Should Not Imperil the Auction's Success by Imposing Eligibility or Bidding Restrictions	.17
	1. This Is the Wrong Proceeding for Addressing Spectrum Holdings Issues	.17
	2. All Interested Bidders Have a Statutory Right to Participate Fully	.18
	3. No Party Identifies Any Competition Analysis for Which a Bidding Restriction Is an Appropriate Remedy	
	4. Restrictions Would Artificially Depress Auction Bid Amounts by Protecting Some Bidders Against Competition in the Auction	.23
	5. Restrictions Could Cause Auction Failure	.26
B.	The Commission Should Reject Requests to Provide Some Large Wireless Operators w Bidding Credits.	
C.	The Commission Should Adjust its Anti-Collusion Rules to Avoid Deterring Auction Participation	.28

IV.	MAXIMIZE THE AMOUNT OF REPURPOSED SPECTRUM AND ENCOURAGE BROADCASTER PARTICIPATION
A.	The Record Affirms the Potential Benefits of Early Action on Several Key Issues30
B.	The Spectrum Act Authorizes the Commission to Conduct the International Coordination Process and Implement the Incentive Auction Concurrently
C.	A Flexible Repacking Formula Will Best Serve Congress's Spectrum Clearing Objectives.
D.	Simultaneous Reverse and Forward Auctions Are Preferable to Sequential Auctions35
E.	Offering Added Bid Options to Broadcasters Has merit
V.	THE FORWARD AUCTION AND SERVICE RULES SHOULD BE DESIGNED TO ENSURE MAXIMUM PARTICIPATION
A.	Service Providers and Manufacturers Should Retain Flexibility to Design Their Devices.
B.	The Auction Should Use a Forward Ascending Clock Process, Generic 5 MHz Blocks, and Anonymous Bidding
C.	Economic Areas Are the Proper License Area for this Auction
D.	Package Bidding Will Help Ensure that 600 MHz Licenses Are Assigned to Providers that Value Them Most Highly
E.	Population-Based Performance Requirements and Prompt Timetables for Repacked and Exiting Broadcasters to Cease 600 MHz Operations Will Promote Rapid Service Deployment
F.	The Commission Should Adopt Verizon's Proposal for an Administrative Rather than Competitive Bidding Assignment Phase.
G.	The 700 MHz Technical and Service Rules Are Appropriate for the 600 MHz Band 50

SUMMARY

The incentive auction Congress authorized in the Spectrum Act gives the Commission a critical opportunity to enable substantial additional spectrum to be put to use to meet the rapidly growing needs of the American public for wireless broadband services. Verizon and numerous other parties support many of the Commission's concepts for the auction, and there is agreement on how the Commission should address many of the issues it raised. With the closing of the comment period today, the Commission can begin putting in place some of the building blocks for the 600 MHz band plan, the design of the reverse and forward auction, and the rules to govern new 600 MHz services.

In building the framework for the incentive auction, the Commission should have as its lodestar repurposing the maximum amount of spectrum through a plan that will incent purchase of and investment in that spectrum for new broadband service to the public, while providing the safeguards to broadcast stations that Congress enacted. Taking the actions Verizon and other commenters here recommend will maximize the likelihood of a successful auction for wireless providers and broadcasters alike, which will in turn maximize auction revenues to support the goals Congress envisioned. These actions fit three overall objectives:

1. The 600 MHz band plan and forward auction rules should maximize the amount and attractiveness of the spectrum made available for licensed services, and should avoid restrictions that will impede bidding or delay service to the public. There is substantial support for important aspects of the Commission's proposed band plan, including auctioning 5 MHz blocks of paired spectrum for Frequency Division Duplexing (FDD) use and locating uplink spectrum adjacent to the 700 MHz band. There is also widespread agreement on certain modifications to the plan to better address interference and device issues. Verizon's proposed band plan mitigates interference problems and promotes the development of cost-efficient,

interoperable devices, while maximizing the amount of paired spectrum available to be auctioned.

- Guard bands. Based on Verizon's engineering analysis, a guard band of 10 MHz is
 technically reasonable to avoid harmful interference between mobile operations and highpowered broadcast operations, and a duplex gap (which is itself a guard band) of 10-11
 MHz is reasonable to avoid harmful interference between the uplink and downlink of
 licensed mobile services.
- Unlicensed Operations in Guard Bands. Consistent with the balance between licensed and unlicensed services that Congress has struck, Verizon supports authorizing appropriate unlicensed operations in guard bands (including the duplex gap) of the 600 MHz band plan. Verizon's proposed band plan has a uniform duplex gap enabling the development and deployment of unlicensed devices operating on the same frequency anywhere in the country, and additional unlicensed devices can operate in the frequencies dedicated to other guard bands subject to geographic constraints. The Commission should not, however, further increase the size of the duplex gap or other guard bands in order to increase the amount of spectrum available for unlicensed use. The Commission is statutorily required first to establish a band plan with guard bands that maximizes the amount and attractiveness of the spectrum to be auctioned, and then determine what unlicensed uses should be permitted within those guard bands. Increasing unlicensed spectrum by creating a band plan that reduces auctioned spectrum would also jeopardize the Spectrum Act's goals by decreasing the revenue received in the forward auction.
- *No Bidding or Eligibility Restrictions*. The Commission should not restrict the ability of forward auction participants to participate in the forward auction, because such

restrictions would violate Section 6404 of the Spectrum Act, distort bidding, reduce auction revenues, and potentially lead to outright auction failure. The spectrum that is licensed in this auction should be included in the spectrum screen already in place, and the Commission should consider requests for modifications to the existing spectrum aggregation policies in the *Spectrum Holdings* rulemaking, not here. Some commenters' proposals for restricting other bidders are not only unlawful but are also transparent efforts to protect themselves from fully competitive bidding. Moreover, no party presents evidence that there is a competitive problem for which a bidding or eligibility restriction might be an appropriate remedy.

Anti-Collusion Rules. The record supports Verizon's recommendation that the
 Commission scale back the scope of its auction anti-collusion rules rather than reflexively
 apply those rules to this auction. The Commission should also reject proposals to expand
 the rules to restrict communications among reverse and forward auction participants, and
 to keep them in force until after licenses are issued to forward auction participants. These
 proposals could deter participation in the auction and depress bidding.

2. The broadcast station repacking process and reverse auction design should encourage broadcaster participation. Commenters support repacking procedures and reverse auction design rules that encourage wide broadcaster participation. Specifically, commenters broadly agree that the repacking methodology and reverse auction design should maximize the amount of repurposed spectrum and encourage broadcaster participation. Announcing a 120 MHz clearing target, and adopting a repacking methodology, broad confidentiality protections for reverse auction bidders, and incentives for early relocation of Channel 51 broadcast operations, all have wide support and warrant prompt action in order to provide more certainty to

interested parties, which will in turn promote a successful auction. The record also supports Commission action on other issues related to the broadcast spectrum as follows:

- International Coordination. If the Commission determines that particular international coordination measures could significantly increase the potential amount of available spectrum for mobile broadband service, it should pursue those efforts as a matter of good spectrum planning. The Spectrum Act does not, as some commenters claim, require the Commission to defer repacking, repurposing and incentive auction preparation until coordination is completed. The Commission should nonetheless quickly determine what coordination measures are appropriate for the auction to proceed consistent with Congress's Spectrum Act objectives.
- Flexibility to Determine Station Population/Coverage. The Spectrum Act grants the Commission flexibility in how it applies its "reasonable efforts" standard for preserving broadcasters' coverage areas and populations served. Arguments that existing population and coverage area must be preserved except in extraordinary circumstances are contrary to the plain meaning of the term "reasonable" and would unnecessarily hamstring the Commission's ability to meet its spectrum repurposing objectives.
- Reverse Auction Design. If the Commission adopts a descending clock approach, which many commenters support, it should set initial bid amounts at prices that will incent widespread broadcaster participation. Because participation in the reverse auction is voluntary, it is important that the Commission set prices at levels that attract broadcasters in order to maximize the amount of spectrum repurposed for mobile broadband use.

 Many commenters also recognize the merits of conducting the reverse and forward auctions simultaneously or in multiple stages, rather than sequentially. Many

commenters also share Verizon's position that the Commission should consider additional VHF band bid options and allow stations to accept more interference in order to provide the Commission more flexibility in the repacking process and potentially repurpose more 600 MHz spectrum. A proposal to allow channel sharing bids requiring changes in a station's community of license has merit and should be considered as well.

- 3. The forward auction design and service rules for the 600 MHz spectrum should promote maximum participation and efficient deployment of new services. Finally, the record provides considerable support for specific actions that will encourage robust bidding for the 600 MHz spectrum. Those actions should include not only auction rules but also rules for the spectrum once it is auctioned that will promote rapid and efficient deployment of service to the public to meet the growing demand for wireless broadband.
 - No Device Mandate. The Commission should continue to afford service providers and manufacturers flexibility to address handset interoperability issues through standards processes, which have yielded rapid development of devices to meet consumers' needs. The issue of Lower 700 MHz device interoperability results from that particular band's uniquely fragmented and impaired nature, so the analogies some parties make to that band are inapposite. Given that interoperability mandates can adversely affect the value of the auctioned spectrum and harm consumers by increasing device costs, the Commission should instead promote interoperability by establishing a sound band plan that avoids the problems of the Lower 700 MHz band.
 - *Forward Auction Methodology*. There is strong support for an ascending clock forward auction methodology. One commenter's proposal for non-generic licenses using different service areas and sequential reverse and forward auctions would result in an

inefficient and complex auction and further complicate the repacking formula. Generic blocks do not have adverse impact on smaller bidders, as an efficient assignment process will ensure that license values are realized in the generic auction bid prices. Verizon supports anonymous bidding because safeguarding the identity of bidders properly ensures that participants' bids are based on license values rather than on other bidders' bidding strategies.

- *EA Service Areas*. There is broad support by large and small carriers for licensing the 600 MHz spectrum on an Economic Area (EA) basis. The small Cellular Market Areas (CMAs) are not necessary to encourage buildout to rural areas, as evidenced by Verizon's own 700 MHz deployment. Nor is it apparent how the use of CMAs will help clear more spectrum through repacking; CMAs would make the forward auction and repacking more complex and undermine participation in the reverse and forward auctions.
- *Package Bidding*. Several commenters agree with Verizon that accommodating package bidding will serve Congress's Spectrum Act objectives. Package bidding can also help mitigate the complexities of the assignment phase of the forward auction, promote efficient network buildout and device development, and ensure that bidding reflects the value that results from bidders' ability to aggregate different licenses to meet their business objectives.
- **Prompt Issuance of Licenses.** Delay in the issuance of 600 MHz licenses to winning forward auction bidders would not only risk suppressing the value of forward auction bids but would also delay deployment of new wireless services to the public. The Commission should thus reject one commenter's assertion that the agency should not issue 600 MHz licenses to forward auction winners until new broadcast allotments are

- assigned. Requiring winning bidders to pay billions of dollars, while also holding their license grants or prohibiting them from deploying service for potentially years afterward, would suppress forward auction bids and could cause the auction to fail.
- Contiguous License Assignment. No commenters took issue with the merits of
 assigning to winning bidders contiguous and consistent blocks across EAs. The
 Commission should adopt Verizon's proposed administrative process utilizing default
 assignment rules can meet that objective while ensuring that licenses are assigned
 expeditiously.
- *Technical Rules.* Commenters overwhelmingly support use of the 700 MHz technical, service and flexible use rules as a model for 600 MHz facilities and services. There is also broad agreement on the benefits of population-based buildout requirements, which Verizon supports. While a few parties propose a handful of different technical rules, they do not supply a valid basis for the Commission to depart from the 700 MHz rules, which promoted the rapid and nationwide deployment of that spectrum to meet consumers' growing wireless broadband needs.

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REPLY COMMENTS OF VERIZON AND VERIZON WIRELESS

I. THERE IS CONSENSUS ON KEY BAND PLAN FEATURES AND PRINCIPLES.

There is widespread support for the Commission's proposal to develop a 600 MHz band plan that makes paired spectrum available in the forward auction, creates 5 MHz blocks, locates uplink spectrum adjacent to the 700 MHz band, licenses spectrum on an Economic Area (EA) basis, and leaves in place existing operations in Channel 37. There is also broad agreement that modifications to the proposed plan would better protect 600 MHz mobile service providers from interference from the remaining broadcast television operations, and also ensure that service providers and their vendors can efficiently incorporate the 600 MHz into wireless devices and networks. Specifically, numerous wireless operators and device manufacturers are concerned about the Commission's proposal to create a large duplex gap² containing broadcast operations.³

¹ See Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Notice of Proposed Rulemaking, Docket No. 12-268, 27 FCC Rcd 12357, ¶¶ 126, 128, 132-33 (2012) ("NPRM"); see also, e.g., Joint Letter of AT&T, Inc., Intel Corp., Nat'l. Ass'n of Broadcasters, Qualcomm, T-Mobile, & Verizon Wireless, GN Docket No. 12-268 (filed Jan. 24, 2013) (Joint January 24 Letter); CTIA Comments at 18-22.

² As discussed in Section II.B.2, a "duplex gap" is a guard band that prevents harmful interference between licensed paired uplink spectrum and licensed paired downlink spectrum. Another type of guard band is one that prevents interference between two distinct types of technologies (such as broadcast

In addition to concerns about harmful interference from broadcasters in the duplex gap,⁴ locating paired downlink spectrum below Channel 37 would increase device costs and sizes, thereby reducing the attractiveness of the auctioned spectrum and increasing the challenges of developing interoperable devices.⁵ As Qualcomm explained, the Commission's approach would create "extremely wide operating bandwidth that cannot possibly be supported via a single antenna in a smartphone form factor."

Verizon's approach to the band plan builds on the benefits of the Commission's proposal, including the flexibility to address different clearing scenarios in different markets, while also addressing the interference and device issues discussed above. Both Verizon band plan configurations (the high-clearing scenario plan and the one for the lower-clearing scenario) avoid impairment of licensed spectrum by broadcast stations by removing them from the duplex gap. They also enable the development of devices with a single antenna – and, in the context of a lower-clearing scenario, a single duplexer. Verizon's band plan therefore promotes the development of cost-effective, interoperable devices that consumers demand while maximizing the amount of paired generic spectrum available for the auction on a nationwide basis.

A. Agreement Is Emerging Among Operators and Device Manufacturers on the Sizes of the Duplex Gap and Other Guard Bands.

There is a consensus among many wireless operators and device manufacturers that the 6 MHz guard bands proposed in the *NPRM* provide inadequate separation between high-power

operations and mobile operations). For ease of reference, throughout this reply the term "duplex gap" (rather than the term "guard band") is used to describe guard bands between licensed paired uplink spectrum and licensed paired downlink spectrum.

³ See, e.g., Joint January 24 Letter; Motorola Mobility Comments at 9-12; CTIA Comments at 25.

⁴ Verizon Comments at 18-19.

⁵ Verizon Comments at 14.

⁶ Oualcomm Comments at iv; see also id. at 13-15.

⁷ See Verizon Comments at 8-9.

broadcast operations and mobile operations to avoid harmful interference. Verizon's engineers have done additional analysis and have worked with other companies to develop further the details of the optimal band plan. A guard band of 10 MHz is reasonable to avoid harmful interference between licensed wireless and licensed broadcast operations. If the guard bands between mobile and broadcast spectrum are too small, they would inadequately protect against interference and would compromise the generic nature (and the value) of the adjacent block of mobile spectrum. The result would be similar to what happened in the Lower 700 MHz band, where harmful interference to and from broadcast operations impaired adjacent licensed mobile blocks and led the development of a band class that did not include the Lower 700 MHz A block.

Verizon has also undertaken additional duplex gap analysis. Verizon's initial comments presented two band plan configurations – one optimal for a high-clearing scenario and another optimal for a lower-clearing scenario. Both plans, like the Commission's proposal, seek to maximize the total amount of cleared spectrum by "flexing" to address different clearing scenarios in different markets, and both have duplex gaps of 10 MHz to protect against interference between licensed mobile uplink and downlink operations. Based on additional analysis, Verizon has determined that in some contexts, increasing the duplex gap to 11 MHz would be reasonable because it would reduce self-interference (desense) within devices (from the transmitter to its receiver). It would also improve insertion loss. For example, the lower clearing scenario band plan (Section I.B.2 of Verizon's initial comments) can be improved by increasing the duplex gap from 10 MHz to 11 MHz and by aligning that duplex gap across all markets so that there is a uniform 11 MHz duplex gap.

⁸ See, e.g., Joint January 24 Letter; Alcatel-Lucent Comments at 22-23; Sony Comments at 2-4; *cf.* Motorola Mobility Comments at 12-13.

⁹ See Verizon Comments at 7-14.

¹⁰ *Id.* at 7 (Figure 1) & 11 (Figure 2).

Guard bands and duplex gaps that are larger than 10 MHz and 11 MHz, respectively. would be technically unnecessary and unreasonable from an engineering standpoint. First, they would result in spectral inefficiency because they would be larger than is appropriate to adequately protect licensed operations from interference. Moreover, a larger duplex gap can make devices more complex and less interoperable. For example, the larger duplex gap of 20 MHz or more proposed by Google and Microsoft, like the Commission's proposal, would substantially increase both the complexity and cost of devices, including by requiring device antennas supporting larger real-time bandwidth. 11 It would increase device size by requiring additional or larger antennas and/or additional tuners or other components. In addition, the larger the real-time bandwidth of an antenna, the greater the reduction in antenna efficiency/gain - particularly for lower frequency blocks - a phenomenon that would negatively and unnecessarily affect device performance if the size of the duplex gap were increased. 12 That same phenomenon would also negatively affect the generic nature of adjacent licensed frequency blocks. All of these drawbacks negatively affect the price and the attractiveness of devices to consumers, and therefore reduce the attractiveness of the auctioned spectrum to wireless operators.

Verizon's proposed band plan already accepts substantial device tradeoffs in order to achieve the goal of maximizing paired generic spectrum. For example, Verizon's high-clearing scenario band plan (Figure 1 in Verizon's initial comments) would require a larger antenna (approximately 30% larger than what is currently used in devices operating on the 700 MHz

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¹¹ The real-time (or instantaneous) bandwidth is the bandwidth at which an antenna's transmit and receive can be active at the same time, given the antenna's efficiency (gain). *See, e.g.*, Qualcomm Comments at 13.

¹² See Qualcomm Comments at 14 fig. 3.

band) and an extra duplexer compared to a band plan based on a 25X25 MHz configuration.¹³ Given the importance of maximizing the amount of paired spectrum to be made available at auction, those trade-offs are reasonable and on balance they increase the attractiveness of the auctioned spectrum.¹⁴ But the additional compromises associated with a band plan with an even larger duplex gap – including compromised performance as well as larger, more costly components – would tip the balance in the wrong direction and would substantially reduce the attractiveness of the auctioned spectrum.

B. Most Parties Agree that Technical Considerations Preclude TDD Operations in the 600 MHz Band.

There is also broad agreement that the Commission should adopt its proposal to design a band plan based on the use of Frequency Division Duplexing (FDD) technologies. Sprint and Clearwire request that the Commission instead accommodate Time Division Duplexing (TDD) technologies. Technological flexibility is an appropriate goal, and TDD technologies such as TDD-LTE may be appropriate in other bands. But in the context of this proceeding, technical considerations require rejecting these proposals.

First, as Qualcomm demonstrates in Table 2 of its comments, placing any uplink transmissions below Channels 46 (668 MHz), as would occur with TDD, generates harmful harmonics that cause harmful interference to higher bands, including into the Global Navigation Satellite System (GNSS) band. That is one of the reasons why Verizon and others support only downlink operations (either the downlink sides of paired spectrum or supplement downlink

¹³ See Verizon Comments at 7-8.

¹⁴ *Id.* at 8.

¹⁵ See, e.g., Joint January 24 Letter; Google and Microsoft Comments at 32-34; Research in Motion Comments at 3, 8-9; NCTA Comments at 11-17.

¹⁶ Sprint Comments at 17-26; Clearwire Comments at 6-11.

blocks) in those channels.¹⁷ Given that TDD blocks are used for uplink as well as downlink, they would cause such harmonic problems – yet Sprint and Clearwire propose no engineering solution.

Second, TDD operations in the 600 MHz band would create major co-existence and mutual interference problems among TDD operators and between TDD and FDD operators. Without synchronized transmission and a common uplink/downlink ratio, adjacent TDD operations create base station-to-base station and mobile-to-mobile interference. For example, different operators with adjacent TDD operations have to coordinate their base station deployment strategy and time-synchronize their networks. Such coordination is particularly difficult with the macro network coverage areas associated with deployment in the 600 MHz band. Moreover, if one operator is using a 40/60 uplink/downlink ratio and an adjacent operator is using a 30/70 ratio, the uplink of the first operator will interfere with the downlink of the second operator, and the downlink of the second operator will interfere with the uplink of the first operator. Without the above-mentioned synergy among adjacent TDD operations to mitigate these interference concerns, there would need to be guard bands of 7 to 12 MHz between TDD blocks (meaning less spectrum to license through the auction) and/or additional (and expensive) filters on base stations between adjacent TDD operations.

Sprint shrugs off these challenges in a footnote acknowledging that "TDD licensees would need to agree on an appropriate asymmetry ratio and synchronize their transmissions." ²⁰

¹⁷ See Verizon Comments at 18.

¹⁸ See Nokia Siemens Networks, Coexistence of Asynchronous TDD Networks, available at http://br.nokiasiemensnetworks.com/file/17691/coexistence-of-asynchronous-tdd-networks, at 7-9 ("Nokia Coexistence Study"). Nokia Siemens concludes that the preferable solution is synchronization.

¹⁹ *Id.* Nokia Siemens concludes that the preferable solution is synchronization. *Id.* at 9.

²⁰ Sprint Comments at 22 n.45.

But Sprint does not explain how that coordination would take place among diverse carriers whose preferences for different uplink/downlink ratios may vary.²¹ Moreover, Sprint does not attempt to square the need to establish a single uplink/downlink ratio for TDD operations with its assertion that TDD is attractive because it purportedly "enables operators to *change* the asymmetry ratio" as traffic demands evolve.²²

Sprint also fails to address the substantial inter-technology coexistence problems created by placing TDD operations adjacent to FDD. Industry coexistence studies also show a need for a 10 MHz guard band between any TDD operations in the 600 MHz block and the FDD operations in the adjacent 700 MHz block, ²³ so Sprint's proposed guard band of 8 MHz adjacent to the 700 MHz band is inadequate. The same co-existence issue renders infeasible Clearwire's proposal that the Commission avoid choosing between TDD or FDD and instead adopt technology-neutral rules so the "marketplace" can "determine technology choices." In the context of this band it is not possible to be agnostic about the TDD/FDD choice because any licensee using its block for TDD operations would preclude the use of the adjacent blocks for FDD operations absent substantial (10 MHz) guard bands between every licensed block. The unavoidable fact that the new 600 MHz band will begin next to FDD operations in the 700 MHz band also compels the use of FDD. ²⁵

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²¹ The propagation characteristics of 600 MHz spectrum make such coordination more difficult than in other bands. For example, TDD operations can co-exist more easily where higher frequency bands are used for small cell deployment because the coverage areas are smaller and more predictable.

²² *Id.* at 20 (emphasis added).

²³ See Nokia Coexistence Study.

²⁴ See Clearwire Comments at 3-6.

²⁵ Of course, the structures of TDD and FDD band plans would be different for other reasons, including the fact that an FDD band plan requires a duplex gap. The TDD/FDD decision is therefore a "gating" issue that requires resolution prior to establishing the band plan.

Because of the substantial guard bands needed to mitigate the extensive co-existence problems (both inter-operator and inter-technology), Sprint's proposed band plan would be far less spectrally efficient than Sprint asserts. Moreover, even setting aside the additional inter-operator guard bands required to implement a TDD plan, Verizon's 2X35 MHz band plan proposal (Figure 1 in Verizon's initial comments) results in the same amount of non-auctioned spectrum as Sprint's proposed band plan, while freeing up far more useful spectrum for auction.

Beyond the technical defects in the Sprint/Clearwire proposal is the fact that only Sprint and Clearwire support TDD operations. No one disagrees that maximizing the usefulness of the spectrum to forward auction bidders will maximize the chances of a successful auction, and most commenters advocate a band plan based on FDD. The record in short should reassure the Commission that it made the right call in proposing an FDD-based band plan.

II. VERIZON SUPPORTS AUTHORIZING UNLICENSED OPERATIONS IN THE GUARD BANDS AND DUPLEX GAP.

A. Authorizing Low-Powered Unlicensed Operations Will Meet the Statutory Requirement that they Not Cause Interference.

As Verizon noted in its initial Comments, it will be possible for the Commission to authorize low-powered operations in the guard bands, including duplex gap, of the band plan that Verizon proposes. Recognizing that unlicensed spectrum has a place in the overall wireless ecosystem, Verizon supports making both the duplex gap and the guard bands available for unlicensed use. Verizon's proposed band plan, while maximizing the amount and quality of the paired spectrum available at auction, makes a substantial amount of guard band spectrum available for unlicensed use, including a uniform 10-11 MHz duplex gap that facilitates nationwide device development and deployment.

²⁶ Verizon Comments at 20.

Section 6407 of the Spectrum Act requires the Commission to authorize only unlicensed operations that do not cause harmful interference to licensed services. ²⁷ Inadequate rules and standards governing unlicensed operations in the 600 MHz band would cause substantial harm to licensed operations and thereby compromise the generic nature of the licensed spectrum. To avoid that, there need to be adequate protections, including appropriate power limits, Out-of-Band Emissions (OOBE) requirements, and in general appropriate standards/rules for unlicensed operations in the guard bands and duplex gap. It may also be necessary to require internal guard bands within a guard band or duplex gap or geographic restrictions for unlicensed uses to avoid harmful interference and protect licensed operations.

As long as the duplex gap is uniform across the country (as Verizon proposes), unlicensed operations that meet the above standards could operate anywhere in the country in the duplex gap frequencies. The other guard bands, however, will not be located in the same frequencies across the country because they need to be located at different frequencies in different markets based on the amount cleared in each market. Therefore, apart from the adjacent channel interference issues discussed above, unlicensed operations in guard band frequencies raise co-channel interference issues. For example, an unlicensed device operating in one of the guard bands in a low-clearing market would cause co-channel interference with mobile operations in a higher-clearing market if it operates in the higher-clearing market. Therefore, geographic constraints on such unlicensed operations will need to be enforced (via a mechanism similar to the white spaces databases) to ensure that unlicensed operations in guard bands are geographically separated from mobile operations on the same frequencies.

²⁷ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6407(e) 126 Stat. 156 (2012) (the "Spectrum Act").

B. Authorizing Unlicensed Operations in Guard Bands While Maximizing Licensed Spectrum Would Achieve Congress's Objectives.

Some parties ask the Commission to consider a band plan that includes more unlicensed spectrum than would be accommodated under a plan that optimizes the amount of auctioned spectrum. For example, Google and Microsoft argue that in order to create the "optimal mix of licensed and unlicensed spectrum," the Commission should establish a band plan with a duplex gap that is twice (or more) the size that is reasonable for a band plan that maximizes the amount of spectrum that is auctioned.²⁸ Similarly, NCTA urges the Commission to "widen" the duplex gap so it is large enough to accommodate "higher power" unlicensed operations.²⁹ The various policy arguments advanced in support of these proposals are misplaced because Congress made the express decision to auction the cleared spectrum in order to raise revenues to support certain statutory objectives. While it is appropriate to promote unlicensed use within the context of the balance that Congress has struck, the Commission does not have discretion to disregard that balance.

1. The Spectrum Act Mandates that All Auctionable Spectrum Be Repurposed via the Forward Auction.

Section 6402 of the Spectrum Act states that the purpose of this incentive auction is to clear broadcast spectrum "in order to" permit the assignment of "new initial licenses" via an auction (a "competitive bidding system"). Section 6403(a)(1) reinforces that mandate, stating that the Commission's task is to "make [the cleared] spectrum available for assignment through a system of competitive bidding." Section 6403(c) makes clear that a forward auction of licensed spectrum is the only mechanism the Commission may use to repurpose the spectrum that clears:

²⁸ Google and Microsoft suggest that a duplex gap greater than 20 MHz and as large as 28 MHz may be "technically reasonable." *See* Google and Microsoft Comment at 31, 37. But as discussed in Section I, a band plan that maximizes auctionable spectrum needs a duplex gap no larger than 11 MHz.

²⁹ See NCTA Comments at 9.

- (c) Forward Auction.--
- (1) Auction required.-- The Commission shall conduct a forward auction in which--
- (A) the Commission assigns licenses for the use of the spectrum that the Commission reallocates under subsection (b)(1)(B)(ii)

The Commission is thus *required* to conduct a forward auction in which it will "assign licenses" for "the spectrum" that clears in the reverse auction.

The Act's only reference to unlicensed spectrum in the 600 MHz band appears in Section 6407. Section 6407(a) states that "[n]othing in" Sections 6402 and 6403 prevents the Commission from implementing "band plans with guard bands." Section 6407(a) thus recognizes the practical necessity of establishing guard bands in order to implement the auction requirement, and it exempts those guard bands from the auction mandate. By authorizing the Commission to establish guard bands *notwithstanding* that auction mandate, Section 6407(a) underscores that the Commission's authority to create guard bands exists only so that it can create a technically reasonable band plan that maximizes the amount of auctioned spectrum.

Then, subpart (b) of Section 6407 states that "such guard bands" (i.e., the guard bands in the band plan created to implement the auction requirement) may be no "no larger than is technically reasonable to prevent harmful interference between licensed services outside of the guard bands." Given that its authority to create guard bands (and to put unlicensed operations in them) is subsidiary to its obligation to repurpose cleared spectrum via auction, the Commission is not permitted to replace otherwise-auctionable spectrum with unlicensed spectrum. In other words, Congress has determined what the balance should be between licensed and unlicensed spectrum for this auction.

2. Proponents of Reducing Licensed Spectrum Fail to Defend the Legality of their Proposals.

Proponents of limiting auctionable spectrum in order to increase the amount of unlicensed spectrum make several unavailing attempts to square their proposals with the statute.

NCTA's lead argument is that the "technically reasonable" requirement does not apply to the duplex gap because a duplex gap allegedly is not a "guard band," and only "guard bands" must be technically reasonable under Section 6407 of the Act.³⁰ That does not pass muster. The Act defines "guard band" as a gap in the band plan put in place to "prevent harmful interference between licensed services" (Spectrum Act, § 6407(a)), which is precisely what a duplex gap does by preventing interference between "licensed" mobile uplink and downlink operations. In fact, in a different portion of its comments, NCTA acknowledges that the purpose of a duplex gap is to "separate *licensed* uplinks and downlinks." There is therefore no support for the notion that the Commission may establish a duplex gap that is larger than what is "technically reasonable."

Equally misguided are assertions that the Commission has broad discretion under the "technically reasonable" standard to configure a band plan that reduces auctioned spectrum in order to create more unauctioned spectrum. Some parties argue that the determination of what is "reasonable" should be made in the context of designing a band plan that advances a dual policy of promoting both licensed and unlicensed spectrum. But as discussed above, the Spectrum Act sets forth the balance between licensed and unlicensed operations. Where Congress sought

³⁰ See NCTA Comments at 12.

NCTA Comments at 9 (emphasis added). Various engineering manuals and papers confirm that the duplex gap is a type of guard band. *See*, *e.g.*, Netkrom Technologies, "Time Division Duplex (TDD) vs Frequency Division Duplex (FDD) in Wireless Backhauls," p. 2, *available at* http://www.netkrom.com/support/whitepapers/TDD vs FDD in wireless backhaul white paper.pdf ("FDD Channel plans maintain a guardband between the downstream and upstream channels" which is "required to avoid self-interference"); Pierre Lescuyer, Frank Bott and F. Bott, *UMTS: Origins, Architecture and the Standard (Computer Communications and Networks)* (Dec. 2, 2003), p. 63.

32 See, e.g., Comcast and NBCUniversal Comments at 44-46; Free Press Comments at 3-4.

specifically to promote unlicensed uses in the Spectrum Act, it did so, directing the Commission to initiate a proceeding to allow unlicensed devices to operate in the 5 GHz band. By contrast, for the 600 MHz band, Congress authorized the Commission to consider unlicensed use only in the guard bands needed to implement the auction mandate. The Spectrum Act thus sets parameters on the amount of spectrum in the 600 MHz band that may be designated for unlicensed use and prevents the Commission from expanding the size of the guard bands without a technical rationale. Verizon supports including unlicensed operations in the guard bands — including unlicensed devices operating on a nationwide basis in the uniform duplex gap — but the Spectrum Act does not empower the Commission to override the balance that Congress enacted.

Moreover, the phrase "no larger than is technically reasonable" does not provide the broad discretion that some parties urge.³³ The Commission has discretion to determine the precise size of guard bands in a band plan that implements the auction mandate,³⁴ but not to disregard that mandate. Given that the authority to establish guard bands is subsidiary to the requirement to auction the cleared spectrum, the statute requires the Commission to first establish guard bands that are no larger than is "technically reasonable" for maximizing the spectrum available for the forward auction, and *then* to consider whether (and what) unlicensed services can be included in those guard bands. In a different portion of its comments, NCTA acknowledges that the Commission's routine practice is to do exactly that:

As part of its spectrum planning, the Commission routinely establishes duplex gaps for licensed services and *then* determines what uses, if any, should be allowed in the gap. For instance, the initial band plan for the broadband personal communications

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³³ See, e.g., Google and Microsoft Comments at 35-36.

³⁴ For example, in the context of a band plan that optimizes auctioned spectrum, the Commission would have authority to implement Google's and Microsoft's request to dedicate "remainder" spectrum to guard bands. *See* Google and Microsoft Comments at 42-43. The guard band is the most reasonable place to locate such extra spectrum for device and auction design purposes. *See* Verizon Comments at 20 n.28.

service (PCS) included a duplex gap to prevent interference between uplink and downlink transmissions within that service. The Commission *then* allocated that gap for unlicensed operations.³⁵

Continuing to follow that practice is what the Spectrum Act requires, and what the *NPRM* correctly proposes.³⁶

3. Compromising the Optimal Band Plan Would Jeopardize the Fiscal Targets of the Incentive Auction and Harm Consumers.

One of Congress's objectives for the incentive auction is to raise revenues to support the Public Safety Trust Fund and the interoperable nationwide broadband public safety network.³⁷ Moreover, the auction will fail completely if the forward auction does not generate sufficient revenues to cover at least the amounts paid broadcasters in the reverse auction, the amount needed to relocate broadcasters, and the costs of the auction.³⁸ Google and Microsoft advance several novel theories why their proposal to replace auctioned spectrum with non-auctioned spectrum might not jeopardize the auction's fiscal targets.³⁹ Setting aside the fact that the Commission does not have the discretion under the statute to adopt their proposal, the reality is that artificially constraining the supply of spectrum to be auctioned would reduce revenue and harm consumers.

Verizon agrees that unlicensed operations should be included in the band plan adopted in this proceeding. But Microsoft and Google urge the Commission to engage in the same behavior a monopolist may engage in: reduce supply and drive up prices. Their principal argument is that

³⁵ NCTA Comments at 11-12 (emphasis added) (internal citations omitted).

³⁶ See NPRM¶ 152 (proposing a specific guard band size and then proposing that the guard bands "may be used for low-powered unlicensed operations that are secondary and cannot cause interference").

³⁷ See § 6403(d)(4)(A).

³⁸ *Id.* § 6403(c)(2)).

³⁹ See Google and Microsoft Comments at 28-31.

by artificially reducing the supply of spectrum to be auctioned, the Commission could drive up the prices paid by auction participants and thereby "compensate" for the reduction in the amount auctioned. In other words, Microsoft and Google ask the Commission to extract economic rents from forward auction participants that ultimately would be borne by consumers. But the losses in consumer welfare caused suppressing the supply of licensed spectrum are exactly the same as those caused by a private monopolist: costs to wireless operators would artificially increase, and otherwise-auctionable spectrum would be unavailable to operators to provide and expand service to their customers, thus reducing service quality, raising prices, or both. Those are not outcomes the Commission should accept, much less promote.

Setting aside the consumer harms caused the Google/Microsoft proposal, there is no basis to embrace the fiction that the U.S. Treasury would remain whole if the Commission reduces the supply of spectrum to be auctioned. Google and Microsoft assert that the "per unit" price paid by forward auction participants would increase if the supply of spectrum is reduced, and they suggest that those higher per-unit prices could theoretically offset the losses incurred by the Treasury on the spectrum that is not auctioned. But Google and Microsoft point to nothing indicating that increased per-unit prices on the spectrum that is auctioned would in fact make up for the losses incurred on the spectrum that is removed from the auction. In fact, the authors of the study that Google and Microsoft cite for their "offset" theory concede that they "are not

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⁴⁰ Google and Microsoft Comments at 29.

The Commission has recognized that failure to make more spectrum available for wireless broadband risks "higher prices, poor service quality, an inability for the U.S. to compete internationally, depressed demand, and, ultimately, a drag on innovation." *See Connecting America: The National Broadband Plan*, at 77 (FCC 2010), *available at* http://download.broadband.gov/plan/national-broadband-plan.pdf.

⁴² *Id.* at 29.

aware of convincing estimates of the aggregate demand for licensed spectrum." ⁴³ Given the undisputed fact that the overall wireless industry faces a spectrum shortage, the spectrum that Google and Microsoft propose to withhold from the auction would be far more likely to increase total revenue when offered and sold in the auction than withholding it would contribute via the increase in per unit price for the remaining spectrum. Thus, artificially reducing supply would risk *significantly reducing* total auction revenue.

Google and Microsoft fall back on a paper suggesting that during the course of an auction the total bids may approximate the "aggregate budgets" that bidders have set aside for the auction. He auction to that theory to assert that reducing the amount of auctioned spectrum may not affect auction revenues. That makes no sense. The paper cited by Google and Microsoft does *not* assert that bidders establish their budgets for spectrum auctions without regard to the amount of (or characteristics of) the spectrum to the auctioned. Instead, it explores how bidders may behave during an auction given the budgets they have established for the auction. The reality is that bidders will *establish* their budgets based on the nature and amount of spectrum to be auctioned, and with the understanding that the bandwidth available in the incentive auction is a substitute for licensed bandwidth in the secondary market, so if the Commission reduces (or impairs) the to-be-auctioned spectrum, the money set aside by operators to participate in the auction will be lower and auction revenue will fall. Conversely, bidders will go into the auction with larger budgets — and will bid more robustly — if the Commission

⁴³ Paul Milgrom, Jonathan Levin, and Assaf Eilat, *The Case for Unlicensed Spectrum*, p. 23 (Oct. 2011) ("Milgrom et al."), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1948257.

⁴⁴ Google & Microsoft Comments at 29-30.

⁴⁵ *Id*.

⁴⁶ See generally, Jeremy Bulow, Jonathan Levin, and Paul Milgrom, Winning Play in Spectrum Auctions (2009), available at http://www.stanford.edu/~jdlevin/Papers/AWS.pdf.

⁴⁷ *Id.* at 2, 7-12.

maximizes the amount and attractiveness of the spectrum that will be available in the forward auction. Google and Microsoft would turn that common-sense fact on its head.

Finally, Google and Microsoft speculate that wireless operators might bid more for the auctioned spectrum because setting aside spectrum for unlicensed use might promote unlicensed services that are "complementary" to licensed services. The paper Google and Microsoft cite theorizes that the availability of unlicensed spectrum could lead to the strengthening of the overall wireless ecosystem in ways that may increase the value of licensed wireless services — and if that does happen, they speculate, then the value of wireless licenses would rise and auction revenues would increase. Whatever the merits of this theory, it provides no support for the notion that bidders might pay more *in this auction* based on speculation that unlicensed uses might, in the future, create "even higher consumer demand" for licensed services. Neither the paper nor Google and Microsoft explain why bidders would pay more for licenses in the incentive auction based on such speculation.

III. THE COMMISSION SHOULD REJECT CALLS FOR RULES THAT WOULD FAVOR SOME BIDDDERS OR SUPPRESS BIDDING.

- A. The Commission Should Not Imperil the Auction's Success by Imposing Eligibility or Bidding Restrictions.
- 1. This Is the Wrong Proceeding for Addressing Spectrum Holdings Issues.

Several commenters urge the Commission to establish rules that would constrain the ability of certain would-be forward auction participants to participate fully in the auction. The Commission should reject those proposals. The Commission's overarching objective should be

⁵⁰ Google & Microsoft Comments at 30.

⁴⁸ See Google & Microsoft Comments at 30.

⁴⁹ Milgrom et al., p. 23-24.

⁵¹ See T-Mobile Comments at 23-33; Sprint Comments at 7-10; Competitive Carriers Association Comments at 8-10; United States Cellular Corporation ("US Cellular") Comments at 30; PISC Comments at 63-68.

to ensure the forward auction's success, and promoting that objective requires not injecting additional uncertainty into what is already a very complex undertaking. Moreover, to the extent any party asserts that spectrum ownership rules are needed, those arguments should be made in the context of the pending *Spectrum Holdings* rulemaking⁵² – and the Commission's action there should not jeopardize the success of *this* proceeding.⁵³

Of course, the 600 MHz spectrum auctioned here should be included in the Commission's spectrum aggregation screen, along with all other spectrum identified in the *Spectrum Holdings* rulemaking and in other proceedings, including applications for SoftBank's acquisition of control of Sprint and Clearwire. As discussed in detail below, if the Commission determines that the grant of a 600 MHz license might cause a party the exceed a spectrum holdings limit that the Commission puts in place, the right way to apply that spectrum limit – and the only policy that is permitted under the Spectrum Act – is to see what spectrum (if any) the party acquires during the auction and then to assess whether post-auction divestitures are necessary to prevent competitive harm.

2. All Interested Bidders Have a Statutory Right to Participate Fully.

As Verizon discussed in its initial comments, Section 6404 of the Spectrum Act codifies the Commission's longstanding practice of allowing all interested parties to participate fully in spectrum auctions. Proposals that restrict otherwise-eligible auction participants violate Section 6404. For example, T-Mobile proposes to bar a would-be participant from bidding in the forward auction unless it has divested itself – prior to the auction – of any spectrum that would

⁵² Policies Regarding Mobile Spectrum Holdings, Notice of Proposed Rulemaking, 27 FCC Rcd 11710 (2012).

⁵³ As stated by the Expanding Opportunities for Broadcasters Coalition ("EOBC"), "there will be many other opportunities, in other contexts and in other proceedings, to address concerns regarding concentration of wireless spectrum ownership," but "there will be only one opportunity to conduct a broadcast incentive auction under Section 6403." *See* EOBC Comments at 14.

place it over the spectrum cap that T-Mobile proposes.⁵⁴ T-Mobile's proposal would violate Section 6404 by directly blocking a person from participating in the auction even though it complies with the minimum requirements for participation (i.e., "auction procedures" and "other requirements to protect the auction process") and meets all "technical, financial, character, and citizenship qualifications."⁵⁵

Sprint proposes a different version of the same eligibility restriction. It proposes to block operators with "more than one-third of the available spectrum below 1 GHz" from acquiring "more than one-sixth of the available 600 MHz spectrum" in the forward auction. ⁵⁶ Sprint's proposal – which it candidly lists as an "eligibility restriction" – also violates Section 6404 because it places a discriminatory "condition" on an otherwise-eligible party's participation. ⁵⁸

In contrast to Sprint and T-Mobile, the PISC acknowledges that the Spectrum Act "provides that the Commission may not prevent a person from participating in a system of competitive bidding." While the Coalition fails to establish that a cap is appropriate in the first place, it correctly notes that under a properly designed cap, there "would in any case be no ineligibility at the auction stage, as an entity surpassing the threshold would decide what spectrum and how much to divest post-auction in each local market." In other words, any

⁵⁴ See T-Mobile Comments at 27-33.

⁵⁵ Spectrum Act § 6404, *codified at* 47 U.S.C. § 309(j)(17)(A).

⁵⁶ Sprint Comments at 9-10.

⁵⁷ See Sprint Comments at 9 (listing its proposed one-sixth cap one of the "eligibility restrictions" that purportedly would prevent "excessive concentration").

⁵⁸ Spectrum Act § 6404, *codified at* 47 U.S.C. § 309(j)(17)(A).

⁵⁹ See PISC Comments at 63.

⁶⁰ *Id.* at 63-64 (emphasis added).

generally applicable spectrum aggregation rule would apply post-auction, allowing carriers to fully participate in the auction.⁶¹

The legislative history of Section 6404 confirms that auction-specific rules are not permissible. Although there was disagreement among legislators about the scope of Section 6404, no one supported an interpretation under which the Commission could establish an ex ante rule. For example, Representative Waxman explained that in the context of a spectrum cap or screen, companies with large spectrum holdings "will be able to acquire new spectrum in an auction, but if the FCC determines the acquisition of that spectrum would diminish competition, the companies can be required to divest other spectrum before they get a license to the new spectrum."62 Representative Upton confirmed that interpretation, noting that a rule regarding "particular carriers" or "particular auctions" is not a rule of "general applicability." ⁶³ In short, neither the language nor legislative history of the Spectrum Act authorize or support the kinds of auctionspecific rules that Sprint and T-Mobile propose.

3. No Party Identifies Any Competition Analysis for Which a Bidding Restriction Is an Appropriate Remedy.

Under 6404, the Commission may establish a rule on "spectrum aggregation" if it is (i) of "general applicability" and (ii) needed to "promote competition." As discussed in Verizon's initial comments, eligibility and bidding restrictions by their very nature risk harming competition by failing to ensure that spectrum is assigned to the bidder that will put it to its highest and best use. As the Commission has explained, restricting auction participation risks

⁶¹ See Verizon Comments at 43.

^{62 158} Cong. Rec. E265, 266-67 (daily ed. Feb. 28, 2012) (speech of Hon. Henry A. Waxman).

^{63 158} Cong. Rec. E237, 238 (daily ed. Feb. 24, 2012) (speech of Hon. Fred Upton). He also noted that any such rule would need to be vetted in a separate rulemaking proceeding so that the Commission could "rigorously examine whether there is any need for action, as well as the pros, cons, and potential unintended consequences of any proposed measures." Id.

⁶⁴ Spectrum Act § 6404, codified at 47 U.S.C. § 309(j)(17)(B).

"reducing the likelihood that the party valuing the license the most will win the license and put it to use for the benefit of the public." Accordingly, such restrictions are theoretically defensible only if their harmful effects are outweighed by a pro-competitive benefit. Yet no party advocating a restriction demonstrates a need for it – let alone a need that outweighs the likely harmful effects.

Rather than present evidence of market failure, foreclosure, or some other problem that needs to be remedied, some parties ask for "protectionist" regulation to limit the competition they would face in the auction. 66 T-Mobile, for example, asserts that "concentration of low-band spectrum stifles competition by increasing the costs of carriers such as T-Mobile to provide the extensive network coverage that consumers demand." But T-Mobile does not identify any "costs" that have been imposed on it. Nor does T-Mobile even *assert* that it is unable to "compete" with other carriers – either for customers or for spectrum. 67 Similarly, Sprint asserts a need "to guarantee that multiple operators have an ability to acquire low-band spectrum so that the economic and innovation opportunities inherent in using low-band spectrum can be fully realized" – but does not identify any opportunities it is currently unable to realize because of a lack of low-band spectrum. 88 In contrast to those conclusory assertions, unsupported by expert declarations, Verizon has explained in the *Spectrum Holdings* proceeding – supported by engineering and economist declarations – that there is no basis to conclude that below 1 GHz

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⁶⁵ Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Second Report and Order, 22 FCC Rcd 15289 at 15385, ¶ 259 (2007).

⁶⁶ See, e.g., Sprint Comments at 9-10; T-Mobile Comments at 27-31; PISC Comments at 63-70.

⁶⁷ T-Mobile Comments at 26.

⁶⁸ Sprint Comments at 10.

spectrum has unique characteristics that could justify regulating it differently from higher-frequency spectrum.⁶⁹

Sprint's and T-Mobile's own spectrum strategies totally undercut the notion that spectrum below 1-GHz is an indispensable part of an operator's portfolio, or that they need special preferences in order to be able to acquire such spectrum. Neither company even asserts that it has ever sought to purchase below 1 GHz spectrum – let alone that it has ever been "foreclosed" from obtaining any such spectrum. Neither Sprint nor T-Mobile participated in the 700 MHz auction, and in recent years neither has filed an application with the Commission to obtain any below 1 GHz spectrum in the secondary market. To the contrary, both T-Mobile and Sprint have focused extensively (if not exclusively) on assembling *higher*-frequency spectrum holdings. T-Mobile participated in the higher-frequency AWS auction, purchased additional AWS spectrum from Verizon last year, and negotiated a merger breakup fee with AT&T that included only higher-frequency spectrum – and none of AT&T's below 1 GHz spectrum. And both T-Mobile and Sprint have decided to make multi-billion dollar investments in companies – MetroPCS and Clearwire – that own substantial higher-frequency spectrum but no (or virtually no) below 1 GHz spectrum. Sprint has touted the attractiveness of the higherfrequency spectrum it is acquiring via the Clearwire transaction.⁷¹

⁶⁹ See Reply Comments of Verizon Wireless, *Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269 (Jan. 7, 2013), at 19-27, Decl. of William H. Stone, & Decl. of Allan L. Shampine.

⁷⁰ In 2007, T-Mobile filed an application to acquire SunCom Wireless, and appears to have acquired one cellular license which was incidental to its overall acquisition of 27 higher-frequency PCS licenses. Verizon is not aware of any other acquisition by Sprint or T-Mobile of below 1 GHz licenses.

⁷¹ See, e.g., See Press Release, Sprint to Acquire 100 Percent Ownership of Clearwire for \$2.97 per Share, available at http://newsroom.sprint.com/article_display.cfm?article_id=2477 (Dec. 17, 2012) ("Clearwire's spectrum, when combined with Sprint's, will provide Sprint with an enhanced spectrum portfolio that will strengthen its position and increase competitiveness in the U.S. wireless industry").

Remarkably, T-Mobile asks the Commission to impose a bright line cap on spectrum holdings precisely because it wants the Commission to *avoid* addressing the central question of whether there is a problem in need of a remedy. According to T-Mobile, the Commission should not get bogged down with the sort of "subjective" inquiries that the Commission undertakes under its existing spectrum screen analysis, such as whether potential entrants will be "foreclosed" and "whether rivals' costs would be increased to the extent that they would be less likely to be an effective competitive constraint." But it is obviously not sound policy to impose a "remedy" based on the notion that the Commission should avoid deciding whether there is actually a *need* for a remedy.

Sprint is similarly disingenuous, asking the Commission for disparate regulation of industry participants. Regarding its transactions with Clearwire and SoftBank, Sprint urges the Commission to not count Clearwire's remaining BRS/EBS spectrum towards the spectrum screen even though Clearwire actively uses that spectrum for mobile operations.⁷³ Yet while seeking to avoid any Commission scrutiny of its *own* spectrum holdings, here Sprint urges the Commission to discriminate against *other* operators. These self-serving requests for bidding or eligibility restrictions should be rejected.

4. Restrictions Would Artificially Depress Auction Bid Amounts by Protecting Some Bidders Against Competition in the Auction.

As discussed in Section I.B.3 above, the Spectrum Act sets fiscal targets for the forward auction. ⁷⁴ As Verizon explains in detail in its initial comments, those targets would be

23

⁷² T-Mobile Comments at 31-32 (internal quotations omitted).

⁷³ See Verizon Wireless Reply Comments, Applications of Sprint Nextel Corporation, Transferor, SoftBank Corp. et al., IB Docket No. 12-343 (Feb. 25, 2013), at 1-2.

⁷⁴ See Spectrum Act § 6403(d)(4)(A).

jeopardized by bidding and eligibility restrictions.⁷⁵ Moreover, restricting auction participation or bidding would enable arbitrage by companies who take advantage of restrictions on their competitors to purchase spectrum at a discount and subsequently sell it for a profit on the secondary market.

T-Mobile suggests that its proposed ex ante spectrum cap may actually increase auction revenue by encouraging greater participation. ⁷⁶ No other party advocating restrictions makes this extraordinary, undocumented claim. T-Mobile bases its theory on a 13-year old statement testimony given by an economist. 77 Notably, the first sentence of the cited passage (which T-Mobile omits) succinctly states: "Typically, spectrum caps lower auction revenues." 78 Dr. Cramton goes on to state there is a potential exception to that typical outcome: in a situation where "incumbent bidders" would otherwise have "an advantage," a cap could theoretically increase revenue because "the non-incumbents know that non-incumbents will win licenses, giving them the incentive and ability to secure the needed financing from capital markets." But T-Mobile cites no evidence that such a situation might actually occur, or that the conditions necessary for such an extraordinary outcome are present here. T-Mobile does not identify the "incumbent bidders" whose participation should be restricted to make way for new entrants, explain why T-Mobile itself would not qualify as an "incumbent," or describe any "advantage" that some bidders might have over other bidders during the auction. Nor does T-Mobile assert that it (or any other potential bidder) will be unable to "secure the needed financing" if it is required to participate in the auction under the same terms as the other bidders. A 2012 study undercuts T-Mobile's unsupported theory, finding that the

⁷⁵ See Verizon Comments at 38-43.

⁷⁶ T-Mobile Comments at 33.

⁷⁷ *Id.* (*citing* Peter Cramton, *Lesson Learned from the United States Spectrum Auctions*, Testimony before the United States Senate Budget Committee 3 (Feb. 10, 2000) ("Cramton 2000 Testimony")).

⁷⁸ Cramton 2000 Testimony at 3.

⁷⁹ *Id*.

empirical evidence indicates that "[i]n any scenario that excludes Verizon and AT&T from bidding, the wealth transfer from the Treasury to the buyers of spectrum would be certain." 80

T-Mobile's and Sprint's request for special treatment and protection against bidding competition should be viewed against the backdrop of their financial ability to bid robustly for spectrum. These are not "mom and pop" businesses lacking the resources or sophistication to compete for the pool of available spectrum. T-Mobile has more than 34 million customers and annual revenues of more than \$21 billion, has recently received a \$3 billion cash breakup fee (in addition to valuable AWS spectrum) from AT&T in the wake of their aborted merger, ⁸¹ and is owned by Deutsche Telekom. That deep-pocketed parent, which is partly owned by the Government of Germany and which had revenues last year of nearly \$59 billion, has provided T-Mobile with financing to acquire MetroPCS for \$1.5 billion, thereby substantially improving T-Mobile's spectrum holdings and increasing its customer base by 25%. ⁸² And Sprint, whose revenue last year was over \$35 billion, is in the midst of a \$20 billion transaction with SoftBank that includes an \$8 billion cash infusion provided specifically so that it can compete more effectively. ⁸³ Both companies are clearly capable of bidding robustly to the extent acquiring 600 MHz spectrum fits into their business plans – and the auction will be successful only if they are

Ana-Maria Kovacs, *Neutral Spectrum Auctions: Maximizing Proceeds and Consumer Benefit*, 13 (Feb. 2012), *available at* http://www.gcbpp.org/files/EPV/EPV Kovacs SpectrumAuctions 21312.pdf.

See, e.g., Nadia Damouni & Paritosh Bansal, AT&T, T-Mobile USA Break-Up is \$6 Billion, Reuters (May 12, 2011), available at http://www.reuters.com/article/2011/05/12/us-mobileusa-att-breakupfee-idUSTRE74B5H220110512 (noting that AT&T has disclosed that it agreed to a breakup fee including \$3 billion cash and \$2 billion worth of spectrum); T-Mobile USA, Inc., Notice of Apparent Liability for Forfeiture, 27 FCC Rcd 4405, ¶25, n.65 (2012).

⁸² MetroPCS has told its investors that the combined company "will have the expanded scale, spectrum and financial resources to compete aggressively with the other larger U.S. wireless carriers." *See* MetroPCS Communications, Inc. Schedule 14A Filing with Securities & Exchange Commission (Feb. 26, 2013), Letter to Shareholders at 1.

⁸³ Applications of Sprint Nextel Corporation, Transferor, SoftBank Corp. et al., IB Docket No. 12-343, Public Interest Statement, 1, 6, 14, 23 (Dec. 4, 2012).

required to engage in meaningful competition for the available spectrum on a level playing field with other bidders. The Commission should not countenance these companies' efforts to foreclose other carriers' access to spectrum and lower their own costs of obtaining spectrum to the detriment of the Spectrum Act's fiscal objectives.

5. Restrictions Could Cause Auction Failure.

In requesting comment on eligibility and mobile holdings issues, the Commission correctly notes that "it is of particular importance to have certainty for bidders in this auction." But many of the proposed restrictions are not only unlawful but also are simply not workable, especially in the context of this already-complex incentive auction.

First, a number of parties propose that the Commission restrict the amount of spectrum that any party could acquire in any particular market to 1/3 the total available in the market, or, in the case of Sprint, 1/6 the total. As Verizon explains in detail in its initial comments, such a prohibition would be virtually impossible to comply with in the incentive auction. Forward auction bidders will not know how much spectrum will ultimately clear, so they will not know ahead of time the amount of spectrum on which they can bid in a market without violating the cap. And the problem is further complicated insofar as different amounts of spectrum may be available in different geographic markets and at different stages throughout the auction, making it potentially impossible for a bidder to coordinate bids across multiple markets while complying with the cap everywhere. At a minimum, such uncertainty can be expected to suppress bidding because bidders will be cautious about potentially "overshooting" and accidentally acquiring too much spectrum; at worst, the unworkable nature of such a cap could cause auction failure.

 $NPKM \parallel 384$

⁸⁴ *NPRM* ¶ 384.

⁸⁵ Verizon Comments at 42-43.

Such auction-specific caps are not the only types of restrictions that would complicate the auction process and imperil the auction's success. The *ex ante* spectrum aggregation cap proposed by T-Mobile and Sprint would cause equally harmful practical problems. Under the proposed rule, operators whose holdings place them at or around the cap would need to divest spectrum prior to the auction in order to get "headroom" so they can participate in the auction. But they would not know whether (or at what price) they could acquire the spectrum they need during the incentive auction. They may therefore choose not to participate in the auction at all to avoid the risk that they may divest valuable spectrum (possibly at a low price) prior to the auction and then fail to replace it (or need to pay a high price to replace it) during the auction. Putting potential bidders in that untenable position could substantially reduce auction participation and suppress auction revenue.⁸⁶

B. The Commission Should Reject Requests to Provide Some Large Wireless Operators with Bidding Credits.

Verizon does not oppose leaving in place the existing Designated Entry program with its current level of bidding credits and eligibility rules. But there is no basis for the Commission to give certain large companies a regulatory hand-out (especially one which obviates the most basic efficiency provided by auctions, i.e., assigning licenses to firms that value them the most) so they can acquire spectrum in the forward auction at a substantial discount over the price that would otherwise be received. MetroPCS, joined by Leap and Cricket, urges that "rather than allocating designated entity (DE) credits by size, credits should be given to applicants in inverse proportion to the amount of attributable spectrum that the applicant holds in the auctioned license

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⁸⁶ Ironically, T-Mobile suggests that companies potentially affected by its proposed spectrum cap might actually prefer an *ex ante* rule because it would purportedly provide greater "certainty" about where they can bid and how much they can acquire. T-Mobile Comments at 31. As explained above, such a rule would *increase* uncertainty, not reduce it.

territory."⁸⁷ Again, such protectionist regulation must be rejected. Under their proposal, they (and other entities that do not qualify as small businesses, such as T-Mobile and Sprint) could receive a discount of up to 60% off the otherwise-winning bid.⁸⁸ That would directly reduce auction revenue, would fail to ensure that spectrum is put to its highest and best use, and would facilitate arbitrage activity.

C. The Commission Should Adjust its Anti-Collusion Rules to Avoid Deterring Auction Participation.

In its comments, Verizon explains why and how the Commission should reassess and scale back the scope of its competitive bidding anti-collusion rules to facilitate a successful auction. ⁸⁹ There is wide agreement among service providers and broadcasters alike that the Commission should not reflexively apply its existing anti-collusion rules and precedents to the incentive auction. Commenters confirm that burdensome anti-collusion rules risk discouraging broadcaster participation in the auction, ⁹⁰ and would unnecessarily prohibit legitimate, normal business activities for forward auction participants. ⁹¹ The Commission should thus: (1) apply the rule only to direct discussions regarding bids or bidding strategies or the post-auction market structure, not to unrelated routine business discussions; (2) narrow the definition of "applicants" to cover controlling interests only; (3) shorten the period during which the rule is in effect; and (4) adopt no restrictions as between reverse and forward auction applicants.

⁸⁷ MetroPCS Comments at 26; *see also* Leap Wireless International, Inc. and Cricket Communications, Inc. ("Leap and Cricket") Comments at 6.

⁸⁸ MetroPCS Comments at 27.

⁸⁹ Verizon Comments at 51-55.

⁹⁰ See Ass'n of Public Television Stations et al. ("APTS") Comments at 33-34; EOBC Comments at 23-24.

⁹¹ See MetroPCS Comments at 15-16 (forward auction bidders "should be able to engage in other business transactions so long as no auction bidding information is shared" and "[t]he Commission should carefully evaluate whether the benefits of the current anti-collusion rules outweigh the clear burdens they impose, particularly when the length of the anti-collusion period is substantial").

In contrast, the Commission should not adopt two proposals that would expand the scope of the anti-collusion rules in this auction. Sprint's assertion that the rules should encompass communications among reverse and forward auction bidders because such communications "could create dangerous and anti-competitive informational asymmetries among bidders" is implausible and unwarranted, precisely because of the very "uncertainty ... about the amount of spectrum and specific frequencies likely to be made available in each market" that Sprint describes in its comments. As Verizon explained, broadcasters will engage directly with the Commission, not with forward auction participants, as to bidding options and bid amounts, and the amount of available spectrum will depend principally on other independent factors such as the application of the Commission's repacking formula and the extent of broadcaster participation and the nature of their bids. 93

The Commission should also reject the National Association of Broadcasters' (NAB) proposal that the auction be deemed "open" until licenses are issued to forward auction participants. This could extend the anti-collusion period by a significant duration, discouraging participation by broadcasters and service providers alike. It would also be inequitable to forward auction bidders if, as is the Commission's current practice, payments for winning bids must be submitted a short period after bidding concludes and the winning bidders are determined. Moreover, the premise of NAB's assertion – that "winning bidders will not know their assigned frequencies ... until after broadcast stations file their construction permit applications" – is

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⁹² See Sprint Comments at 5 n.11.

⁹³ Verizon Comments at 54.

⁹⁴ See NAB Comments at 50-51.

⁹⁵ The auction closed and winning bids for Auction 73 (700 MHz) were announced shortly after bidding activity ceased, and final payments were due one month after close of the auction was announced. *See Auction of 700 MHz Band Licenses Closes*, Public Notice, DA 08-595 (2008).

incorrect.⁹⁶ To issue new 600 MHz licenses to winning bidders, the Commission merely needs to know the frequencies from which remaining broadcasters will relocate, and nothing precludes the Commission from granting winning bidders their licenses for those frequencies on a coprimary basis for an interim limited period until broadcasters cease their existing 600 MHz operations.

IV. THE REPACKING METHODOLOGYAND REVERSE AUCTION DESIGN SHOULD MAXIMIZE THE AMOUNT OF REPURPOSED SPECTRUM AND ENCOURAGE BROADCASTER PARTICIPATION.

A. The Record Affirms the Potential Benefits of Early Action on Several Key Issues.

Verizon and other commenters describe several measures that warrant expeditious

Commission action. There is broad agreement that prompt resolution of these issues is both feasible and important to ensure that broadcasters in particular have certainty regarding the reverse auction and the post-auction repacking process, and adequate time to evaluate whether or how to participate. The comments affirm that announcement of a minimum 120 MHz clearing target will send a strong signal to all stakeholders of the Commission's commitment to repurposing spectrum for mobile broadband. They also support broad confidentiality protections for broadcasters' bids in order to encourage broadcaster participation. Commenters also affirm that establishing incentives for early relocation of Channel 51 broadcast operations

⁹⁶ See NAB Comments at 50-51.

⁹⁷ Verizon Comments at 23.

⁹⁸ See Verizon Comments at 22-23; Cisco Comments at 4, 9; EOBC Comments at 11-12; High Tech Spectrum Coalition Comments at 6; see also Broadcaster for the Promotion of Channel Sharing Arrangements at 1 ("recovering 120 MHz of spectrum in the voluntary auction is aggressive but achievable, even in the nation's largest markets, provided the Commission establishes the right incentives and *opportunities* for stations to participate"); CTIA Comments at 30 (supporting EOBC policy of 120 MHz).

⁹⁹ See Verizon Comments at 23. 29; APTS Comments at 19-23; Entravision Comments at 7; EOBC Comments at 22; State Broadcaster Ass'ns Comments at 16; Tribune Co. Comments at 6-8; see also AT&T Comments at 67.

would help achieve the Commission's repacking and repurposing objectives. ¹⁰⁰ The Commission thus should take prompt action on those matters.

There is also broad support for a descending clock reverse auction. Verizon agrees with EOBC that, in order to maximize the amount of spectrum repurposed for mobile broadband use, the Commission needs to ensure that initial bid amounts are set at prices that will encourage widespread broadcaster participation.

Finally, commenters uniformly agree that more complex issues, such as international coordination¹⁰² and the repacking methodology,¹⁰³ warrant prompt Commission action because they are necessary for the Commission to resolve fundamental incentive auction components, such as the 600 MHz band plan and auction design.

B. The Spectrum Act Authorizes the Commission to Conduct the International Coordination Process and Implement the Incentive Auction Concurrently.

There is near-universal agreement by all stakeholders that the Commission should act promptly to initiate the necessary negotiations with the governments of Canada and Mexico to coordinate broadcast channel allotments and assignments on the border areas. ¹⁰⁴ If the Commission determines that particular coordination measures could significantly increase the potential amount of available spectrum for mobile broadband service, it should pursue those efforts as a matter of good spectrum planning.

¹⁰⁰ See Verizon Comments at 37-38; Alcatel-Lucent Comments at 18; Competitive Carriers Ass'n at 13-14; CTIA Comments at 28-30; MetroPCS Comments at 28-30; see also Nokia Siemens Comments at 12; Qualcomm Comments at 20; US Cellular Comments at 59-61.

¹⁰¹ See Verizon Comments at 27-28; CEA Comments at 30; EOBC Comments at 4; Mobile Future Comments at 9-10; Prospective Reverse Auction Participant at 6.

See, e.g., CEA Comments at 33-34; EOBC Comments at 24-25; ABC Television Affiliates Ass'n, CBS Television Network Affiliates Ass'n, FBC Television Affiliates Ass'n, and NBC Television Affiliates ("Network Affiliates") Comments at 11-12; NAB Comments at 10.

¹⁰³ Verizon Comments at 21-22; AT&T Comments at 78; NAB Comments at 17-18.

¹⁰⁴ See supra note 102.

Several broadcasters, however, incorrectly assert that Congress required the Commission to *complete* international coordination prior to conducting the incentive auction. Congress made clear in the Spectrum Act what measures require "completion" prior to repacking. Congress has consistently recognized the Commission must engage in the international coordination process in implementing any new broadcast allotments and individual assignments in border areas, and that any final reassignments must reflect the outcome of that process. In the DTV transition, for example, the Commission adopted new DTV allotments and a future plan for assignments while anticipating that its plan could require adjustments to conform to the agreements. It adopted channel election and repacking requirements even as international coordination remained incomplete for many stations. And in August 2007, after Congress imposed a February 2009 deadline to complete the digital transition, the Commission adopted a new Table of Allotments that expressly left individual stations subject to the outcome of international coordination processes. In International coordination thus cannot reasonably be interpreted to put all other repacking, repurposing and incentive auction preparation on hold.

¹⁰⁵ See, e.g., CBS Corporation, Fox Entertainment Group, Inc., NBCUniversal Media, LLC, The Walt Disney Company, and Univision Communications Inc. ("Broadcast Networks") Comments at 8 (Commission must "complete coordination with Canada and Mexico ... before finalizing rules relating to the repacking mechanism."); Eagle Creek Broadcasting of Laredo, LLC, et al. Comments at 3 (must "resolve international border coordination issues before the auction occurs.); State Broadcaster Ass'ns Comments at 12 ("full and mutually agreeable coordination with Canada and Mexico was intended by Congress as a condition to commencing the auction process"); see also Network Affiliates' Comments at 12 ("auction cannot go forward without changes to international treaties").

¹⁰⁶ See Spectrum Act § 6403(f)(2) ("no reassignments or reallocations under subsection (b)(1)(B) shall become effective *until the completion of*" the reverse and forward auctions (emphasis added)).

¹⁰⁷ See Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, Sixth Report and Order, 12 FCC Rcd 14588, ¶ 171 (1997), reconsideration, Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order, 13 FCC Rcd. 7418, ¶¶ 138-140 (1998).

¹⁰⁸ See Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion To Digital Television, Report and Order, 19 FCC Rcd 18279, ¶¶ 39, 71 (2004).

¹⁰⁹ See Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, 22 FCC Rcd 15581, ¶¶ 103-105 (2007).

Nothing in the Spectrum Act shows that the Commission now has *less* flexibility to address international coordination issues in the context of the incentive auction, where technical issues associated with repacking must be resolved in a much shorter time period, than it did during the DTV transition from the 700 MHz band.

The Spectrum Act addresses broadcasters' legitimate concerns collectively through the coverage area and population provisions and the restrictions on repacking to VHF spectrum, while also giving the Commission flexibility and discretion to address those concerns in a manner that maximizes the spectrum to be repurposed for mobile broadband. The international coordination requirements should be viewed in a similar light. The Commission should therefore quickly determine what international coordination measures are appropriate for the auction to proceed consistent with Congress's Spectrum Act objectives, including the steps that can be undertaken in parallel with or after the auction.

C. A Flexible Repacking Formula Will Best Serve Congress's Spectrum Clearing Objectives.

Commenters disagree on the scope of the Commission's discretion under the Spectrum Act's "reasonable efforts" standard for preserving broadcasters' coverage areas and populations served. Verizon agrees with several commenters that Congress gave the Commission considerable flexibility in the repacking process in order to repurpose 600 MHz spectrum for mobile broadband services. In contrast, NAB's and the Network Affiliates' assertions that Congress intended that the term "all reasonable efforts" means that broadcasters are entitled to

¹¹⁰ See Spectrum Act §§ 6403(b)(2)-(3).

¹¹¹ See id. § 6403(b)(2) (requiring "reasonable efforts to preserve" broadcasters' existing coverage area and population served); id. § 6403(f)(2) requiring reassignments of broadcast stations to new channels and reallocations of spectrum for mobile broadband to become effective simultaneously "to the extent practicable"; id. § 6403(h) (Section 316 protest rights inapplicable).

¹¹² See AT&T Comments at 12, 76-77; CEA Comments at 15-16, 31-32; CTIA Comments at 34-35; Mobile Future Comments at 16-18.

their *exact* population and coverage area except in "extraordinary" or extremely limited circumstances is not supported by the statute. This incorrect interpretation would also effectively nullify the statutory reference to OET Bulletin 69 by compelling the Commission to apply each individual station's application of the Bulletin prior to February 2012 and preclude the Commission from applying the uniform methodology and set of assumptions necessary to conduct the incentive auction. It also would hamstring the Commission's express authority to "make such reassignments of television channels as [it] considers appropriate" to achieve Congress's critical objective of repurposing spectrum for mobile broadband and competitive bidding in the forward auction.

NAB itself applies a more generous interpretation of the term "reasonable" in the repacking reimbursement context, appropriately recognizing that the Commission has discretion to determine eligible reimbursement costs under Section 6304(b)(4) of the Spectrum Act for repacked broadcasters and MVPDs. 114 Under this more sound interpretation of "reasonable," NAB advocates applying the word's "ordinary, natural meaning, in keeping with settled principles of statutory construction" – i.e., "not extreme or excessive," and "moderate, fair." NAB's use of the term here appropriately applies to the repacking standard as well.

Finally, the Commission should ensure that using factors such as a station's operating or enterprise value risks as "scoring" criteria for reverse auction bids does not deter broadcaster

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¹¹³ See Broadcast Networks Comments at 6 (increased interference permitted "if and only if all other reasonable efforts to avoid new interference have failed."); NAB Comments at 19; Network Affiliates Comments at 26-37; Sinclair Broadcasting at 10-12.

¹¹⁴ See NAB Comments at 58-59; see also Comcast and NBCUniversal Comments at 24-29 (describing wide variety of costs that are appropriately reimbursable under the Spectrum Act); DIRECTV and DISH Comments at 6-10 (same); NCTA Comments at 18-21 (same).

¹¹⁵ See NAB Comments at 58-59, n.87 (quoting Webster's Ninth New Collegiate Dictionary at 981 (1984)).

participation in the reverse auction. Given Congress's spectrum repurposing objectives, scoring a bid more highly based on the amount of spectrum cleared is appropriate. If the additional criteria proposed in the *NPRM* risk deterring broadcaster participation – whether by creating uncertainty as to the Commission's potential devaluation of their bids, or unnecessarily complicating the bid acceptance and repacking processes – they could undermine the viability of the reverse auction and jeopardize Congress's Spectrum Act objectives.

D. Simultaneous Reverse and Forward Auctions Are Preferable to Sequential Auctions.

A variety of commenting parties addressing the Commission's proposed incentive auction design broadly support the concept of conducting the reverse and forward auctions simultaneously. While these commenters differ regarding the precise mechanics of the auction and some recommend departures from the approach described in the Auctionomics Paper, they broadly recognize that the simultaneous or multi-staged approach is preferable to the sequential approach described in the *NPRM*, with respect to both encouraging broadcaster participation and facilitating a quicker conclusion to the incentive auction and a more efficient outcome.¹¹⁷

Verizon agrees.

The record also demonstrates all of the various incentive auction components – the 600 MHz band plan, repacking, and reverse and forward auction design – are interdependent, and that the mechanics and feasibility of any dynamic bidding approach are dependent on the effectiveness and predictability of the Commission's repacking methodology and software. In the meantime, the Commission should continue to engage auction experts and ensure that the repacking methodology is fully disclosed and tested, as broadcasters and mobile broadband

¹¹⁶ See EOBC Comments at 18-20.

¹¹⁷ See Verizon Comments at 24-27; EOBC Comments at 11; CEA Comments at 30-31; T-Mobile Comments at 42-43.

providers uniformly urged in their comments, and recalibrate its approach as necessary as the capabilities and limitations of the repacking methodology become known.

E. Offering Added Bid Options to Broadcasters Has Merit.

Many commenters reflecting a broad cross section of stakeholders share Verizon's view that the Commission should consider the feasibility of providing additional bid alternatives.

These include accepting higher interference in order to provide the Commission more flexibility in the repacking process and potentially repurpose more 600 MHz spectrum for mobile broadband, and additional VHF band options. These bidding options could present a win-win alternative for broadcasters and mobile broadband providers alike. The Commission should also consider the feasibility of EOBC's proposal that the Commission permit channel sharing bids that would require changes in a station's community of license by permitting a station to channel share with another in its DMA. This could make it easier for stations to find channel sharing partners and potentially free more spectrum for repurposing.

While EOBC supports giving reverse auction bidders the flexibility to submit different bid options, it does not support expanding the types of available bids due to concern that such an approach would make the reverse auction too complex for broadcasters. This is a fair concern, which underscores the importance of adopting a repacking formula to accommodate such bids. If the Commission determines it cannot incorporate additional bid options without making that formula overly complex for itself and for broadcasters, then it should err on the side of a simpler

¹¹⁸ See CEA Comments at 13; CTIA Comments at 33; Entravision Comments at 9-10, 13; Harris Corporation Comments at 23-24; Mobile Future Comments at 8; Motorola Mobility Comments at 7; Qualcomm Comments at 24-25; TIA Comments at 13-14; Tribune Co. Comments at 4; US Cellular Comments at 6-8; see also APTS Comments at 35 (supporting high VHF bids).

¹¹⁹ See EOBC Comments at 20-22.

¹²⁰ See EOBC Comments at 17-18; see also T-Mobile Comments at 51-52.

¹²¹ See TIA Comments at 14.

formula. While T-Mobile similarly states that alternate bids are not amenable to administrable rules, Verizon presented in its initial comments a potential framework in this regard for higher interference bids that is based on straightforward, demonstrable criteria that broadcasters utilized in the DTV transition. ¹²² In any event, given the potential for higher interference bids to make additional spectrum available for clearing, it is important that the Commission determine the feasibility of alternative bids.

In addition, the Commission should allow bids to relocate to lower VHF, as Verizon recommended. Harris Corporation opposes that approach in order to preserve that band for only LPTV, AM and FM broadcasting. 123 Its restrictive approach, however, would impair the Commission's repacking options, and potentially undermine Congress's objectives of repurposing 600 MHz spectrum for mobile broadband while preserving meaningful opportunities for broadcasters to continue offering service.

V. THE FORWARD AUCTION AND SERVICE RULES SHOULD BE DESIGNED TO ENSURE MAXIMUM PARTICIPATION.

A. Service Providers and Manufacturers Should Retain Flexibility to Design Their Devices.

Historically the Commission has not imposed interoperability requirements when auctioning spectrum for wireless operations, wisely leaving to equipment manufacturers and carriers the development of device standards. Manufacturers and their customers have consistently and successfully worked out interoperability issues through industry-driven standard setting processes that facilitate a robust device ecosystem free of interoperability problems. Some parties in this proceeding point to industry's adoption of two band classes for the Lower 700 MHz band to support requests that Commission impose an "all-600 MHz band"

¹²² See T-Mobile Comments at 52; Verizon Comments at 32-35.

¹²³ Harris Corporation Comments at 23-24, 27-28.

interoperability requirement.¹²⁴ But the unique issues in the Lower 700 MHz band have no applicability here, and the Commission should not adopt any such requirement. Instead, it should facilitate interoperability by adopting a well-conceived band plan that minimizes interference issues and obviates the need to consider first-ever device regulation.

The challenges of Lower 700 MHz interoperability arise from that particular band's uniquely fragmented and non-generic nature. Because of impairments to and restrictions on the A block of the Lower 700 MHz band due to nearby high power broadcast operations, a band class was developed that included only the non-impaired blocks in the Lower 700 MHz band. As Verizon has explained, an industry-driven solution to the resulting interoperability problem can emerge once the Commission relocates Channel 51 broadcasters. Those problems can be avoided here by ensuring that the band plan (i) avoids impairing blocks of licensed spectrum (e.g., by not placing broadcasters in duplex gap) and (ii) facilitates cost-effective development of devices that operate across the entire band. As discussed above and in Verizon's initial comments, Verizon's proposed band plan is based precisely on those principles: it minimizes impairments to licensed spectrum, and it facilitates the development of a single device with a single antenna (and, in the case of the lower-clearing scenario, a single duplexer). As discussed in Section I.A above, one of the numerous consumer benefits promoted by such a band plan is that it promotes interoperability.

The Commission's historical reliance on industry standard-setting processes to achieve device interoperability has gone hand in hand with its flexible use policy and has promoted the evolution of a strong, vibrant wireless ecosystem. For example, in the PCS auction, the

¹²⁴ See, e.g., T-Mobile Comments at 21; Leap and Cricket Comments at 7; MetroPCS Comments at 28; U.S. Cellular Comments at 23-30.

¹²⁵ See Comments of Verizon Wireless, *Promoting Interoperability in the 700 MHz Commercial Spectrum*, WT Docket No. 12-69 (June 1, 2012) at 1.

Commission rejected calls for an interoperability mandate in favor of "allow[ing] PCS to develop in the most rapid, economically feasible and diverse manner." That historical policy, which departed from the command-and-control interoperability regime imposed on analog cellular, was a success. Interoperability has emerged through efficient, industry-driven processes. The Commission has recognized that such processes are preferable to government mandates because they are developed by industry participants through collaborative processes that enable, rather than displace, innovation and investment. 127

By contrast, interoperability mandates – especially if combined with band plans (such as the Commission's proposal) that create substantial device challenges – can negatively affect investment and also reduce the value of the auctioned spectrum. It is already common for devices to have multiple antennas and duplexers in order to support existing bands, and the antennas required for 600 MHz spectrum will be larger than in higher frequency bands. Device complexity, size, and costs are very real factors in determining the attractiveness of auctioned spectrum, and there are limits to what components can be included in devices without reducing their economic viability.

Of course, some additional device complexity is inevitable for any band plan that takes advantage of a high-clearing scenario in order to repurpose a large amount of paired spectrum. For example, if the Commission repurposes 120 MHz or more on a nationwide basis, even under Verizon's proposal it would be necessary to include an extra duplexer in devices. That high-clearing scenario, of course, would be a good "problem" to have. It is not a "problem" that

¹²⁶ Amendment of the Commission's Rules to Establish New Personal Communications Services, Memorandum Opinion and Order, 9 FCC Rcd 4957, ¶ 162 (1994).

¹²⁷ *Id.* ¶ 164 (stating that "we do not want to discourage innovation in designing PCS services").

¹²⁸ Verizon Comments at 8.

invites *a priori* government intervention because such intervention would impede the efficient development of band classes that ensure interoperability. Notably, even under that high-clearing scenario, Verizon's band plan enables the use of a single tunable antenna to cover the entire band, thereby substantially reducing the potential device challenges that might arise. The Commission should therefore promote interoperability by establishing a sound band plan that avoids the unique challenges of the Lower 700 MHz band, and should allow the industry standard setting process to drive the development of cost-effective interoperable devices. ¹³⁰

B. The Auction Should Use a Forward Ascending Clock Process, Generic 5 MHz Blocks, and Anonymous Bidding.

There is strong record support for the Commission's proposed ascending clock forward auction methodology or for another dynamic bidding approach that enables the Commission to complete the auction efficiently. While the approach used for the incentive auction will depend in large part on the effectiveness of the repacking formula, Verizon agrees with various commenting parties that this approach has the most potential to achieve a prompt and efficient forward auction. ¹³¹

There is also broad support among potential forward auction participants for the Commission's proposal to use generic 5 MHz blocks as the bidding unit for the forward auction,

¹²⁹ Verizon noted that under a high clearing scenario, it would be theoretically possible to auction even more paired spectrum than under Verizon's proposal by placing some paired spectrum below Channel 37. *Id.* However, both interference concerns and device issues (including the possible need for an additional antenna or tuner) militate against adopting such a band plan.

T-Mobile also suggests that the Commission could theoretically ensure interoperability by assigning spectrum blocks to winning bidders on a random basis, thus forcing licenses to deploy devices that can operate across the entire band. T-Mobile Comments at 21-23. That ill-conceived proposal would reduce the value of the spectrum to potential bidders and would impose major costs on licensees, who would need to engage in post-auction swaps in order to convert their disjointed licenses into rational portfolios. *See* Section V.F, *infra*.

¹³¹ See Verizon Comments at 44; AT&T Comments at 40-41; CEA Comments at 32; see also EOBC Comments Decl. of Jeffrey A. Eisenach at 7-8.

and the Commission should adopt that proposal. ¹³² US Cellular's proposal for non-generic licenses using different service areas would result in an inefficient and complex forward auction and further complicate the repacking formula, and none of its reasons for opposing generic blocks warrants a different approach. US Cellular's recommendation is also premised on the Commission conducting the reverse and forward auctions sequentially, which will make the reverse auction less appealing to broadcasters – thus undermining US Cellular's own stated objective of making "large amounts of spectrum" available to wireless service providers. ¹³³ Given the broad support for generic blocks among a variety of wireless service providers, and the demand for additional spectrum for mobile broadband service (which US Cellular itself acknowledges), ¹³⁴ the record does not support the conclusion that non-generic blocks are necessary to encourage adequate forward auction participation.

In any event, US Cellular's principal concern relates to the purported impact of generic blocks on "smaller" bidders. As Verizon explains in its initial comments, contrary to US Cellular's assertion, "an additional auction stage" to assign individual licenses would *not* be necessary and, in any event, the use of generic blocks helps ensure that the value of the licenses is reflected in the bidding *for the generic blocks*. Moreover, assuring that winning bidders for multiple generic blocks are assigned licenses for contiguous blocks, with some consistency across EAs, will help ensure that the value of the licenses is realized in the forward auction bid prices (and thus by taxpayers) and not deferred to private parties in the secondary market. 136

¹³² See Verizon Comments at 44; AT&T Comments at 40-41; CEA Comments at 20; CTIA Comments at 15; T-Mobile Comments at 19.

¹³³ See US Cellular Comments at 3, 20.

¹³⁴ See US Cellular Comments at 2.

¹³⁵ See US Cellular Comments at 20; Verizon Comments at 45-47.

¹³⁶ See Verizon Comments at 45-47.

Concerns that such procedures will result in interoperability challenges to the detriment of smaller bidders are misplaced. As discussed above, the interoperability issues of the Lower 700 MHz licenses can be avoided here, and US Cellular's speculation as to license assignment procedures does not provide a basis for the *NPRM*'s well-reasoned proposal for 5 MHz generic blocks.

Verizon supports anonymous bidding in the forward auction. Various commenters, however, assert that bidders' identities should be disclosed to improve the information available to other bidders – namely, who their competitors are and how they valuate the spectrum in question – information that purportedly is critical for smaller entities to meaningfully participate in the auction. In adopting rules for the Lower 700 MHz auction, the Commission considered and rejected those precise arguments, and the Commission should do the same here. Anonymous bidding ensures that bidders are focused on the value of the licenses to their business, not on other bidders and their bidding strategies, and thus ensures a more efficient – and competitive – auction outcome consistent with Congress's Spectrum Act objectives. As the Commission has explained, disclosing bidder interests and identities during the auction risks anti-competitive behavior and bidding strategies. While MetroPCS asserts that such information would enable it to bid more effectively against larger operators, evidence indicates that the opposite effect – avoiding such competition – is the more likely result. Moreover, as with the 700 MHz auction, "[u]ncertainties regarding what market leaders and equipment manufacturers

¹³⁷ Competitive Carriers Association ("CCA") Comments at 18; Leap and Cricket Comments at 8-9; MetroPCS Comments at 11-13.

¹³⁸ See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, et al., Second Report and Order, 22 FCC Rcd 15289 ¶¶ 280-84 (2007) ("700 MHz Second Report and Order").

¹³⁹ See MetroPCS Comments at 11-12; Peter Cramton and Jesse A. Schwartz, *Collusive Bidding: Lessons from the FCC Spectrum Auctions*, 17 Journal of Regulatory Economics, 229, 246 (May 2000) (finding that "smaller bidders were reluctant to bid against large bidders in the [broadband PCS] DEF auction" and underscoring the desirability of an anonymous auction).

might do in [the 600 MHz] band after it is licensed will not be substantially mitigated during the auction by information regarding the identities of parties placing bids." The Commission should use anonymous bidding for this reason as well.

C. Economic Areas Are the Proper License Area for this Auction.

There is broad support by large and small carriers alike for the Commission's proposal to issue all licenses on an Economic Area ("EA") basis. 141 T-Mobile correctly states that larger service areas could facilitate a more efficient forward auction than EAs. 142 The Commission's proposed use of EAs, however, is an appropriate middle ground that balances the Commission's statutory and policy interest in ensuring that smaller carriers can meaningfully participate in the forward auction, while ensuring that the auction is manageable for the Commission's planned auction design and for forward auction participants. Moreover, T-Mobile concedes that package bidding can mitigate "geographic exposure risk" associated with EAs, and the Commission should address such risk through that mechanism instead. 143

The Commission should not issue licenses on a CMA basis, or through a combination of CMAs and EAs, as US Cellular and other commenters propose. As Verizon states in its comments, that approach would require inefficient aggregation during or after the auction. Nor are service areas smaller than EAs necessary to promote buildout in rural areas, as US Cellular argues. Verizon is using 700 MHz spectrum (which the Commission licensed in even

 $^{^{140}}$ See 700 MHz Second Report and Order ¶ 282.

¹⁴¹ See Verizon Comments at 60-62; AT&T Comments at 54; Cellular South, Inc. Comments at 8; CCA Comments at 14-15; MetroPCS Comments at 18-19.

¹⁴² See T-Mobile Comments at 15-17.

¹⁴³ See T-Mobile Comments at 17.

¹⁴⁴ See Leap and Cricket Comments at 4; National Telecommunications Cooperative Association ("NTCA") Comments at 3-5; US Cellular Comments at 10-19; RTG Comments at 2-7.

¹⁴⁵ See Verizon Comments at 60-61.

larger REAGs) to deploy LTE coextensively with its EV-DO network to serve literally hundreds of rural markets and, through innovative secondary market transactions such as the LTE in Rural America initiative, is working with many smaller carriers to promote LTE deployment in other rural areas. Reasonably small EA markets, together with construction benchmarks and the robust secondary market, remain the appropriate methods of promoting deployment in rural areas.

Finally, the use of CMAs will not enable the Commission to repurpose more spectrum for mobile broadband than EAs. Indeed, by US Cellular's own analysis of the potential impact of repacking alone (with no exiting broadcasters), the use of CMAs instead of EAs could not clear appreciably more spectrum throughout most of the Northeastern U.S., large swaths of the Midwest, Northern and Southern California, and significant geographic areas on the U.S.-Canada border west of the Great Lakes. US Cellular's comments thus affirm that the Commission's spectrum repurposing objectives will require significant broadcaster participation and robust forward auction bidding – both of which would be undermined by the very licensing scheme and auction design that US Cellular proposes.

Moreover, US Cellular's analysis is based on the faulty premise that should the reverse auction fail to clear the entire band, the Commission will not auction licenses that are constrained by requirements to protect broadcasters remaining in the band. It is highly probable that the wireless use of frequencies co-channel with such a remaining broadcaster would be for downlink operations (transmissions from base stations), but wireless carriers can carefully engineer the coverage from base stations to meet any Commission interference requirements. Thus, US

¹⁴⁶ See US Cellular Comments, Att. A at 2-3.

Cellular's untenable position appears to be that, in the name of auction simplicity, spectrum should be kept idle.

D. Package Bidding Will Help Ensure that 600 MHz Licenses Are Assigned to Providers that Value Them Most Highly.

Several commenters agree with Verizon that accommodating a degree of package bidding that enables some regional aggregation of license bids during the forward auction will serve Congress's Spectrum Act objectives. Parties opposing package bidding do not refute the economic efficiencies of such an approach, or that package bidding can help ensure that spectrum will be licensed to parties that value it most highly. Package bidding can also help mitigate the complexities of the assignment phase of the forward auction and, by promoting geographic consistency, can help promote efficient network buildout costs to consumers' benefit. Carriers may achieve substantial economies of scale, passing those costs savings on to consumers, by developing devices that can be deployed on a footprint-wide basis, but any potential holes in the footprint would affect those economies.

Given Congress's Spectrum Act objectives, CCA's opposition to package bidding on the basis that the rules "should allow bidders who value particular blocks of spectrum to have the opportunity to acquire that spectrum" is not valid; it is critical that the 600 MHz spectrum go to entities that value it *most highly*. Leap's assertion that "package bidding may enable a large carrier to obtain valuable licenses at a significant discount from the actual prices at which it values the individual licenses" is inaccurate. As Verizon explains, package bidding enables

¹⁴⁷ Verizon Comments at 49-50; AT&T Comments at 7-9, 51-58; CEA Comments at 19; EOBC Comments Decl. of Jeffrey A. Eisenach at 8; Mobile Future Comments at 10, 12-14; T-Mobile Comments at 20.

¹⁴⁸ See CCA Comments at 18.

¹⁴⁹ See Leap and Cricket Comments at 9; see also CCA Comments at 18; RTG Comments at 9; US Cellular Comments at 51-57.

bidders to reflect the value of the EA alone and as part of a regional aggregation, which ensures that the value of the latter is reflected in the auction bid price paid to the Treasury rather than to another service provider in the secondary market. ¹⁵⁰ Finally, US Cellular's assertions that package bidding would violate the Commission's Section 309(j) obligations are meritless; ¹⁵¹ the Commission's rules have long included package bidding as a competitive bidding design component. ¹⁵² To the extent the Commission is concerned that combination bids will increase computational complexity in administering the auction, it should be noted that they reduce complexity for bidders. Moreover, the Commission can considerably reduce complication by designating a set number of combinatorial bids options, such as REAGs or a national license.

E. Population-Based Performance Requirements and Prompt Timetables for Repacked and Exiting Broadcasters to Cease 600 MHz Operations Will **Promote Rapid Service Deployment.**

In its comments, Verizon explains how population-based performance requirements with a "keep what you use" component, consistent with those adopted for the AWS-4 and WCS services, appropriately balance the Commission's interest in efficient spectrum use, consumers' interests in prompt deployment of competitive mobile broadband services, and service providers' need for technically feasible and economically reasonable deadlines.¹⁵³ The record generally supports this approach, with Cellular South and NTCA in particular advocating a similar policy, and many parties opposing untested approaches like "use it or lease it" or "use it or share it." 154

¹⁵⁰ See Verizon Comments at 50.

¹⁵¹ See US Cellular Comments at 55-56.

¹⁵² 47 C.F.R. § 1.2103(a)(4); Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for September 6, 2000, Comment Sought on Modifying the Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding, Public Notice, 15 FCC Rcd 8809 (WTB 2000).

¹⁵³ See Verizon Comments at 64-68.

¹⁵⁴ See Cellular South, Inc. Comments at 5, 9-10; see also CCA Comments at 17; CTIA Comments at 38-41; NTCA Comments at 5-6.

CCA's proposal for a geographic area approach in certain rural areas, however, is unnecessary, particularly if the Commission uses the existing "keep what you use" approach that provides a substantial incentive to deploy service throughout an EA. Further, while some commenters assert that uniform construction requirements adversely affect smaller and rural service providers, they also agree that, if construction requirements are imposed, population-based requirements are appropriate, and they do not advocate more stringent performance requirements for larger entities. ¹⁵⁵

The record also affirms that construction deadlines must account for the need for repacked and exiting broadcasters to cease operations in the 600 MHz band. Timely and predictable access to the repurposed 600 MHz spectrum is critical to ensure mobile broadband providers' interest in and demand for that spectrum. Many broadcasters, however, support a lengthy construction period for repacked stations length than three years in some cases. Requiring winning forward auction participants to pay billions of dollars in winning bid amounts immediately after the auction concludes, while holding their license grants in abeyance or prohibiting them from deploying and launching service for years afterward, is not only inequitable but risks regulatory uncertainty to such a degree as to suppress forward auction bids. For similar reasons, the Commission should thus reject NAB's assertion that the agency cannot

¹⁵⁵ See US Cellular Comments at 42-44 (asserting that uniform construction requirements disproportionately affect smaller and rural carriers); MetroPCS Comments at 22-24 (same but conceding population-based requirements); CCA Comments at 17 (population-based requirements).

¹⁵⁶ See Verizon Comments at 67-68; CTIA Comments at 39.

¹⁵⁷ See Verizon Comments at 67-68; AT&T Comments at 78-79; CEA Comments at 34; CTIA Comments at 34, 39-40; Leap and Cricket Comments at 10; Mobile Future Comments at 20; Sprint Comments at 12-13; TIA Comments at 17-18; US Cellular Comments at 57-59.

¹⁵⁸ See NAB Comments at 49-50, 53-54 (30 months); State Broadcaster Associations at 15 (at least 30 months).

¹⁵⁹ APTS Comments at 24-27; LIN Media Comments at 7; Post-Newsweek Stations Comments at 5-6.

issue 600 MHz licenses to forward auction bidders until repacked broadcasters file their construction permit applications. Such an approach could further delay winning bidders' ability to commence deployment while subjecting them to the vagaries of the repacking and international coordination processes, and nothing prohibits the Commission from issuing licenses on a co-primary basis with broadcasters, akin to the Commission's approach toward broadband PCS licensees and incumbent private operational fixed licensees.

Verizon opposes Google/Microsoft's proposals to permit white space unlicensed use in the repurposed 600 MHz band until such time as service providers initiate service, and on a similar interim basis in areas where service providers do not meet their performance requirements. That would contravene Congress's mandate that the repurposed spectrum, other than guard bands, be assigned for licensed rather than unlicensed use. Moreover, it would further complicate the prior coordination and notification processes necessary for mobile broadband providers to initiate service via their 600 MHz licenses and potentially require that detailed information about mobile broadband providers' coverage area, signal strength, and service launch plans be incorporated into a system similar to a white spaces database.

Google/Microsoft's proposal also risks creating interference disputes between mobile operators and unlicensed users and database operators. The Commission's spectrum management efforts should focus on relocating existing users, including unlicensed white spaces users, *out* of the repurposed 600 MHz band – not on developing a new regulatory regime to enable those uses to remain in or reenter the band.

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¹⁶⁰ See NAB Comments at 51.

¹⁶¹ See supra discussion at Section II.B.

F. The Commission Should Adopt Verizon's Proposal for an Administrative Rather than Competitive Bidding Assignment Phase.

Verizon and other commenters have underscored the importance of the license assignment phase to an efficient and effective forward auction. No parties dispute the merits of contiguous and consistent blocks across EAs, which an assignment phase should facilitate. Serizon agrees with AT&T and T-Mobile that the full value of the 5 MHz spectrum blocks should be reflected in the generic bids to the extent possible. Unlike AT&T, which would have the Commission use a competitive bidding process to achieve these objectives, Verizon submits the Commission should first determine the feasibility of administrative processes during the assignment stage, and rely on package bidding for the generic blocks and the liberal exchange of licenses after the auction to achieve that objective. Verizon's proposed default assignment rules could help ensure that the value of the licenses is reflected in the generic bids and that the assignment stage concludes expeditiously. T-Mobile's proposal that the Commission use an administrative process of random assignment to achieve that objective, however, could discourage or distort bidding and shift a segment of bid prices from the generic bids to the post-auction secondary market and thus would be contrary to Congress' Spectrum Act objectives.

¹⁶² See Verizon Comments at 45.

¹⁶³ See NPRM¶ 64 ("[T]he assignment procedures would assign contiguous blocks to bidders that bid for multiple blocks in the same geographic area and could take into account the need to coordinate frequencies across adjacent areas."); see also Research In Motion Comments at 7 (auction design should promote contiguous spectrum blocks for winning bidders).

¹⁶⁴ See Verizon Comments at 27; see also Nokia Siemens Comments at 14 (winning bidders might want to exchange licenses to mitigate technical and interference issues that may arise).

¹⁶⁵ See id.; AT&T Comments at 58-63.

G. The 700 MHz Technical and Service Rules Are Appropriate for the 600 MHz Band.

Verizon and other commenters, including, notably, equipment vendors, overwhelmingly support use of the 700 MHz technical and service rules as a model for 600 MHz facilities and services. ¹⁶⁶ Commenters also support a flexible use regulatory approach for 600 MHz licensees. ¹⁶⁷ The Commission should thus reject various other service or technical rule proposals that unnecessarily delay or restrict 600 MHz licensees' flexible use operations. Specifically, no special coordination or notice procedures are warranted for secondary BAS licensees to cease 600 MHz operations beyond the 30-day notice period proposed in the *NPRM*. ¹⁶⁸ This proposal would unnecessarily delay the deployment of licensed mobile broadband services. In addition, the Commission should not tailor its OOBE limits for 600 MHz licensees to protect wireless

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¹⁶⁶ See Alcatel-Lucent Comments at 28-29; CEA Comments at 26; see also CTIA Comments at 30; Harris Corporation at 27; Qualcomm Comments at 24; TIA Comments at 18.

¹⁶⁷ See Verizon Comments at 58-60; CEA Comments at 16, 21; CTIA Comments at 30.

¹⁶⁸ See Network Affiliates' Comments at 41-42 (proposing 90 days instead of 30 days notice prior to commencing operations).

microphones in adjacent bands.¹⁶⁹ This proposal would afford secondary users rights at the expense of new 600 MHz licenses in a manner contrary to Congress's objectives for the repurposed band.

Respectfully submitted,

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¹⁶⁹ See Shure Comments at 38.